



CDF Operations Report

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All Experimenters' Meeting



STORE SUMMARY

Store	Start Date	Duration (hours)	Inst Lum Initial e30 cm-2 s-1	Int. Lum Delivered nb-1	Live Lum nb-1	Tevatron Terminate
3359	4/5	28.3	48.7	2,248	1,602 71.3%	ok
3361	4/6	26.5	43.9	1,992	1,615 81.1%	ok
3363	4/8	31.3	55.8	2,443	2,182 89.3%	Quench on eos study
3366	4/9	22.9	44.5	1,591	1,227 77.1%	ok
3368	4/10	27.9	48.9	2,050	1,865 91.0%	ok
3371	4/12	0.9	46.1	144	24 16.8%	quench on scrape
Total 3359-3368		136.8		10,323	8,492 82.3%	

All stores with "compromised COT": SL1,2,3 OFF; SL4,5 reduced gain



CDF Store Summary

- Efficiency averaged for week lower than we would like (goal > 90%) but comes from numerous small problems.
- Beam conditions have been troublesome and we have run several stores “bumping” up against our limits for including silicon detector. MCR has been patient working with us during these periods.
- Just before end of store 3368, we lost a pump that provides water from Main Ring ponds to CDF chillers. B0 computing room overheated slightly and our main online file server shut itself down. This locked up silicon power supply program such that we had no clean way to power down silicon without shutting down low voltage (= thermal cycle) as well as bias voltage. MCR kept store in so we could sort out this issue. (thank you)



Summary: McCrone Analysis of COT Wire

Wires are 40 micron tungsten with about 0.5 micron gold plating.

EDS Analysis: Wire samples are probed with an 5-10keV electron beam. Electrons are ejected from inner atomic shells and the energies of the x-rays generated when these shells are refilled gives a measure of the atomic makeup of the sample. A new wire showed mostly gold with some carbon (carbon thought to be from contamination of sample). An aged wire showed mostly carbon with some oxygen and some gold. This analysis is not sensitive to hydrogen.

XPS Analysis: Samples are irradiated with 1400ev x-rays. An energy scan of the secondary electrons emitted gave an indication of the molecular bonds. The best measurement of an aged wire gave 88% CC and CH bonds and 10% C-O bonds. C=O bonds were <1%. This scan is not sensitive to OH bonds.

FTIR Analysis: Sample is irradiated with infrared photons. The reflected photon spectra is examined for dips associated with absorption bands to give information on the molecular structure. The spectrum from an aged wire had the following features: a broad dip associated with the O-H bond (stretching); sharp dips associated with CH₂ and CH₃ bonds; and much smaller dips associated with C=O bonds.

FESEM Analysis: A very precise electron beam from a point field emission source gave a very high resolution picture of surface features. The following picture shows an area of an aged wire where the coating has been removed. In the foreground is the bare wire. In the background is the coating (appears dark, about 0.3 microns thick) with some small sub-micron nodules on it.

Slide information courtesy Morris Binkley for COT group.



COT WIRE ANALYSIS (cont'd)

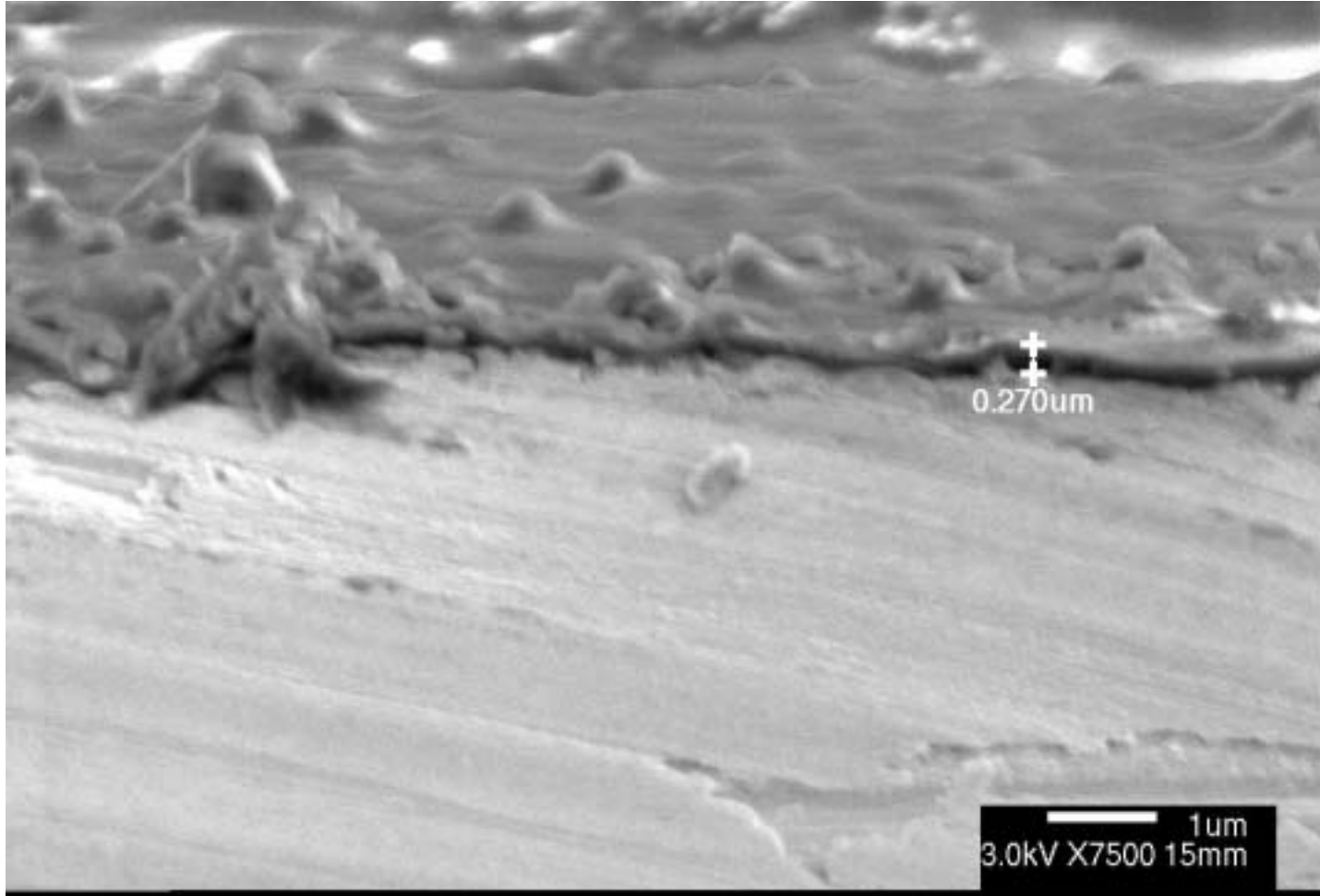
The tests all indicate that the coating is mostly hydrocarbon chains with some oxygen in the form of O-H and C-O bonds. No contaminants were identified. The level of silicon, a common contaminant, appeared to be very low.

These results are *consistent* with the coating coming from the ethane and the isopropanol in the gas. In this **hypothesis** polymers are built up as the gas flows through the chamber in the presence of avalanches. When the polymers get long enough, they stick to the wire.

Slide information courtesy Morris Binkley for COT group.



COT WIRE ANALYSIS (cont'd)



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